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REMARKS

The Office action of April 11, 2006, has been carefully considered.

Claims 24 through 32, 34 through 46 and 48 through 51 have been rejected under 35 USC 112, first paragraph, as failing to comply with the enablement requirement in terms of the use of tailored fiber placement to arrive at both constant fiber volume and constant fiber thickness.

In an attempt to resolve this issue, Applicants have now amended Claim 24 to recite that the fiber preform has substantially constant material thickness at the node point; substantially constant fiber volume content is no longer claimed. This amendment is consistent with original Claim 1 of the present application.

It is noted that Claim 48 does not require either constant volume or constant thickness at the node point, so it is not seen why this rejection should apply to Claims 48 through 51, which require only tailored fiber placement to form the fiber preform.

In light of the amendment to Claim 24, withdrawal of this rejection is requested.

Claims 24 through 32, 34 through 46 and 48 through 51 have been rejected under 35 USC 112, first paragraph, in the recitation that the grid is "self-supporting."

Applicants recognize that the term "self-supporting" does not appear in the specification as filed. However, it should be clear to one of ordinary skill in the art that the resultant preform will either be flexible or self-supporting (rigid). With reference to page 7, lines 10 through 19 of the present specification, it is clear that the product of the invention is used in high temperature furnace and factory construction, "as column bases for chemical reactors" and "as

batch carrier systems." Such applications are consistent only with a rigid grid; indeed, a flexible material could not serve as a column base for a chemical reactor. A base could certainly not serve as a support if it were not itself self-supporting.

If the Examiner believes that the term "rigid" is a more acceptable term given the content of the specification, Applicants will agree to amend the claims to recite that the fiber preform is rigid.

Withdrawal of this rejection is requested.

Claims 24 through 32, 34 through 46 and 48 through 51 have been rejected under 35 USC 112, second paragraph, in the use of the term "self-supporting." The basis for this rejection appears to be that Claim 24 does not recite carbonization of the polymeric material. Claim 24 has now been amended to recite such pyrolizing/carbonizing/ graphitizing after removal of the fiber preform from the mold. Further, since the preform is now removed from the mold and subsequently pyrolized or graphitized, it is clear how the rigid structure if formed.

Withdrawal of this rejection is requested.

It is further noted that Claim 24 has been amended to recite that the grid component produced has a flat surface area, as disclosed in the specification in the paragraph bridging pages 9 and 10, and claim 48 has been amended to recite the flat surface area and the pyrolizing step of claim 49, which has been canceled.

Claims 24, 26 through 31, 38 and 40 through 45 have been rejected under 35 USC 103(a) over Deckers et al in view of Kam et al, WO '932 and Koury, further taken with one of Kawasaki et al or Blad et al '679, and optionally taken with the admitted prior art as exemplified by Matheij et al. Further,

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Claims 25, 32, 34 through 37 and 46 have been rejected under 35 USC 103(a) over this combination of references in further view of Booth, Claims 40 to 42 have been rejected under 35 USC 103(a) over this combination of references further taken with Handermann et al or Kent et al, Claims 48 and 50-51 have been rejected under 35 USC 103(a) over Deckers et al in view of Kam et al, WO '932 and Koury and optionally in view of Matheij et al, and Claim 49 has been rejected under 35 USC 103 over the previous combination of references further taken with Booth.

Even though tailored fiber placement was known at the time of the invention, it was not known at that time to produce grids having constant fiber thickness over the entire plane defined by the grid.

This can be seen in the Deckers et al reference, which does not disclose producing a grid according to tailored fiber placement and does not teach a constant thickness for the grid. Evidence can be found in a comparison of Figures 6 and 7, because it can be seen that either the fibers cross each other resulting in a larger thickness or the fibers are butt-jointed at crossings resulting in formation of a gap. Thus, the thickness is not constant at the intersections. The grids produced in this manner are not suitable for serving as a carrier; if the grid is used in accordance with Figure 7, a base is additionally needed as shown in the figure for holding the rods of the grid. If a grid is produced according to Figure 6, then a flat surface of the grid cannot be achieved.

Kam et al produces non-self-supporting grids, and does not use the tailored fiber placement method. Continuous fibers are not used in Kam et al, so that the problem of material thickness at the intersections does not occur. Thus, Kam et al cannot be combined with Deckers et al because the manufacturing methods are different and Kam et al does not in

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any event produce a self-supporting grid. Rather, stiffened structural components produced by molding a stiffening member, preferably formed of a graphite-epoxy composition, are described.

WO '932 relates to a fiber placement machine. One of ordinary skill in the could use this apparatus to produce composite articles utilizing tailored fiber placement, but there is no disclosure or suggestion of utilizing such a machine to produce a self-supporting grid having the claimed features.

Koury also relates to an arrangement for utilizing tailored fiber placement, but does not otherwise teach the steps of Claim 24. In fact, continuous fibers are not layered and stitched to achieve a preform, but rather fibers are placed directly into channels of a mold. Hence, the method of Koury differs totally from the claimed method.

Similarly, the Matheij reference discloses tailored fiber placement, but does not otherwise disclose the steps of the invention.

Kawasaki discloses a grid comprising crossing fiber bundles. The number of fiber bundles in one direction deviates from the number of fiber bundles of the other direction as disclosed at column 3, lines 12 *et seq*. The result is that the grid has different flexibility in different directions, as disclosed in the abstract. There is no disclosure or suggestion forming such fiber bundles by tailored fiber placement followed by curing and pyrolysis.

The grids manufactured in accordance with Blad are not composed of a preform made by tailored fiber placement. Rather, tapes comprising several layers are produced which are then cut to produce a grid (see column 4, lines 3 *et seq*, and line 28).

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The Handermann reference discloses production of prepregs using reinforcing fibers without any reference to making grids with at least one intersection or node point having a substantially constant material thickness. There is no disclosure or suggestion of producing a grid which is usable by itself.

The Kent et al reference discloses the manufacture of fiber reinforced laminates, and also does not disclose a grid as presently claimed.

Finally, Booth has been cited to show carbonizing a layer of carbon fabric plies impregnated with a carbon containing matrix material. While carbonizing is known, the matrix material as shown clearly does not have a constant fiber thickness at the node point, and thus it would not be obvious from Booth to form such a material having a flat surface.

Withdrawal of these rejections is requested.

In view of the foregoing amendments and remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,

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